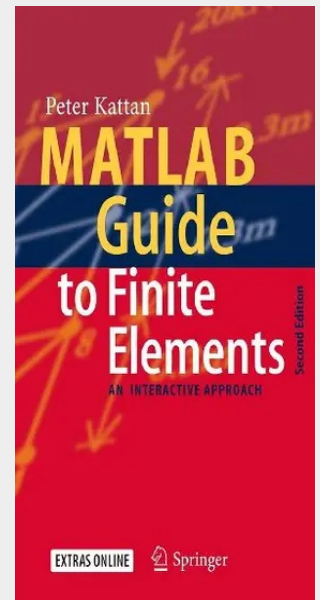


## MATLAB Guide to Finite Elements

An Interactive Approach

This successful textbook explores the numerical implementation of Finite Element Analysis using the computer program MATLAB, which is very popular today in engineering and engineering education. The book contains a short tutorial on MATLAB as well as a systematic strategy for the treatment of finite element methods. Useful to students and researchers in engineering, it provides examples and exercises from mechanical, civil and aerospace engineering, as well as from materials science. The book stresses the interactive use of MATLAB. An extensive solutions manual is provided as well, which includes detailed solutions to all the problems in the book for classroom use. This second edition includes a new brick (solid) element with eight nodes and a one-dimensional fluid flow element.

later versions. In addition, the CD-ROM contains a complete solutions manual that includes detailed solutions to all the problems in the book. If the reader does not wish to consult these solutions, then a brief list of answers is provided in printed form at the end of the book. I would like to thank my family members for their help and continued support without which this book would not have been possible. I would also like to acknowledge the help of the editor at Springer-Verlag (Dr. Thomas Ditzinger) for his assistance in bringing this book out in its present form. Finally, I would like to thank my brother, Nicola, for preparing most of the line drawings in both editions. In this edition, I am providing two email addresses for my readers to contact me (pkattan@tedata.net and pkattan@lsu.edu). The old email address that appeared in the first edition was cancelled in 2004. December 2006 Peter I. Kattan Preface to the First Edition 3 This is a book for people who love finite elements and MATLAB. We will use the popular computer package MATLAB as a matrix calculator for doing finite element analysis. Problems will be solved mainly using MATLAB to carry out the tedious and lengthy matrix calculations in addition to some manual manipulations especially when applying the boundary conditions. In particular the steps of the finite element method are emphasized in this book. The reader will not find ready-made MATLAB programs for use as black boxes. Instead step-by-step solutions of finite element problems are examined in detail using MATLAB.



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